

**REMARKS**

Claims 16-26 are presently under consideration in the application. Claims 1-15 have been withdrawn as a result of a previous election requirement.

Claims 16 and 23 have been amended herein. Favorable reconsideration of the application, as amended, is respectfully requested.

***I. ALLOWABLE SUBJECT MATTER***

Applicants acknowledge with appreciation the indicated allowability of claims 23 and 24, subject to being amended to independent form. Applicants have amended claim 23 herein so as to be in independent form. Accordingly, claims 23 and 24 should now be in condition for allowance.

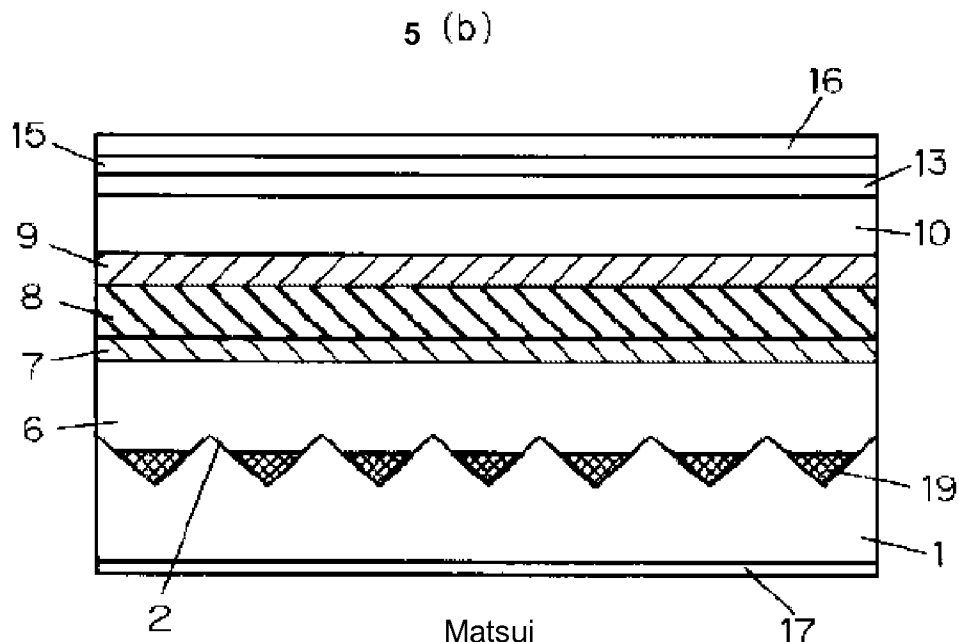
***II. REJECTION OF CLAIMS 16-22 AND 25-26 UNDER 35 USC §103(a)***

Claims 16-22 and 25-26 stand rejected under 35 U.S.C. §103(a) based on applicants admitted prior art (AAPA) (namely FIG. 1) in view of *Matsui* (previously cited by applicant).

The Examiner relies on *AAPA* as teaching each of the features recited in claim 16 with the exception of the saturable absorbing layer including one portion that is absorbing for light and another portion that is not absorbing for light. Applicants generally concur with the Examiner in this regard. (See e.g., spec. page 10, third full paragraph and page 14, third paragraph).

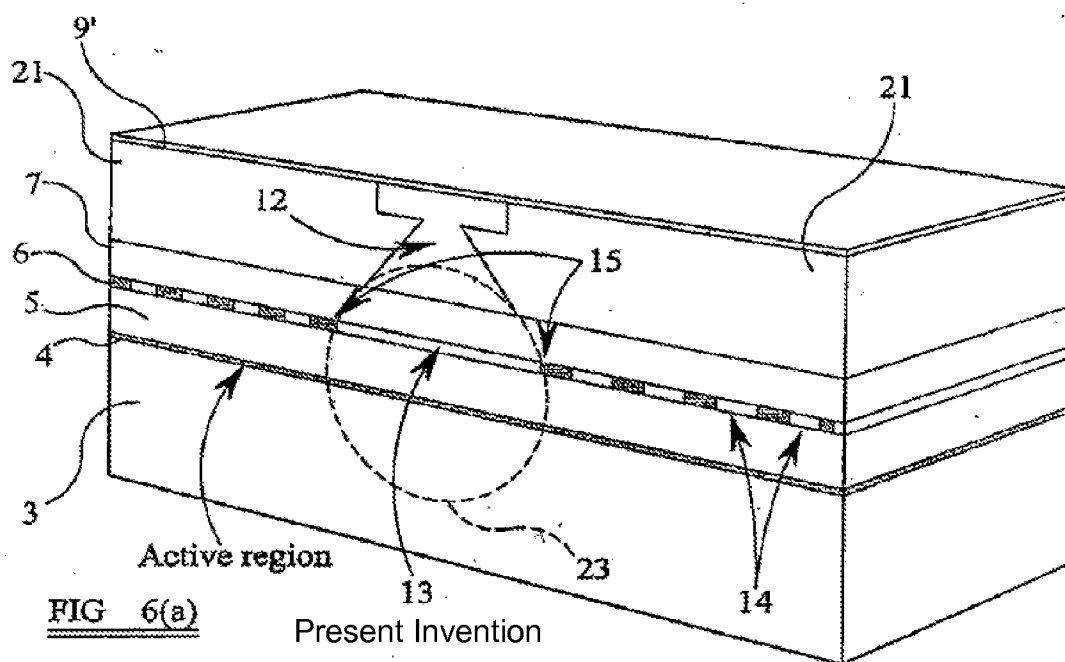
On the other hand, the Examiner relies on *Matsui* as teaching the use of a periodic absorber layer that is capable of absorbing one portion of light from the active

layer and includes portions that do not absorb light from the active layer. The Examiner argues that it would have been obvious to a person having ordinary skill in the art to modify the *AAPA* with the periodic absorber layer of *Matsui* so as to result in the claimed invention.



Referring to Fig. 5(b) of *Matsui* (reproduced above), the Examiner argues that *Matsui* teaches the use of a periodic absorber layer 19 in a semiconductor device that is capable of absorbing one portion of light from the active layer and one portion that does not absorb light from the active layer. (O.A., p. 3).

*Matsui* does teach a periodic absorption layer 19. However, the periodic nature of the absorption layer 19 is simply a result of a triangle-wave shaped cross-section of the adjacent cladding layer. The triangle-wave shaped cross-section of the cladding layer essentially allows pockets of the absorption material to form periodically in the layer 19.



The present invention relates to a semiconductor device that is quite different from that shown in *Matsui*. According to the present invention, a uniform layer of absorption material is used to form the absorption layer. Thereafter, the absorbing properties of the absorbing layer are altered in various portions so as to change the absorbing properties and make one portion absorbing and another portion not absorbing. As represented in Fig. 6(a), for example, a layer 6 having a uniform thickness is modified in selected areas with respect to band-gap energy in order to achieve absorbing areas (dark portions of layer 6) and non-absorbing areas 14. (See, e.g., Spec., p. 20, third full para.).

Applicants have amended claim 1 in order to emphasize such distinction. In particular, applicants have amended claim 1 to recite how the saturable absorbing layer includes the one portion for absorbing light and the other portion for not absorbing light.

The absorbing and non-absorbing portions each have a uniform thickness as exemplified in Fig. 6(a).

*Matsui* does not teach or suggest a saturable absorbing layer having absorbing and non-absorbing portions having uniform thicknesses. The triangle-wave shaped cross-section of the layer 19 in *Matsui* does not present absorbing and non-absorbing portions each having uniform thicknesses as recited in amended claim 1. For example, the thickness of the absorption layer 19 would be greatest at the apex of each triangle cross-section. Thus, even if the teachings of *Matsui* were to be combined with *AAPA*, the invention of claim 1 would not result.

Further, applicants respectfully submit that the Examiner has not provided sufficient motivation for making the combination proposed by the Examiner. For example, the Examiner argues that one having ordinary skill in the art would be motivated to modify the *AAPA* based on the teachings of *Matsui* for the benefit of having a low current and high emission efficient device. However, applicants note that *Matsui* teaches the desire for the periodic absorption layer 19 in order to result in the fact that "the absorption hardly saturates and the absorption loss is reduced". In other words, *Matsui* teaches providing the periodic absorption layer 19 to avoid absorption saturation. (See, e.g., Abstract).

The present invention, on the other hand, wishes for the absorbing layer to saturate in order to provide self-pulsation. (See, e.g., spec. page 2, second full paragraph). Thus, a person desiring a self-pulsation semiconductor device would not be motivated by *Matsui* to utilize the absorption layer 19. *Matsui* specifically teaches away by pointing out that such absorption layer 19 is provided to avoid absorption saturation. Applicants note claim 26 which specifies that the device is a self-pulsation laser device.

In summary, *Matsui* does not teach or suggest absorbing and non-absorbing portions each having uniform thicknesses as recited in amended claim 1. Moreover,

one having ordinary skill in the art would not be motivated to combine the teachings of *Matsui* with *AAPA* for the simple reason that *Matsui* teaches directly away from such a combination.

Applicants therefore respectfully request withdrawal of the rejection.

### **III. CONCLUSION**

Accordingly, all claims 16-26 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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DATE: January 30, 2007

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